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| 10/589,592 | 07/05/2007 | Nikola Anastasijevic | 20941/0211441-US0 | 8644 |

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| EXAMINER |
|---|
| MENDEZ, ZULMARIAM |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1723 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/589,592 | ANASTASIJEVIC ET AL. | |
| | Examiner | Art Unit | |
| | ZULMARIAM MENDEZ | 1723 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *23-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/15/2006*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Group I, including claims 1-22 in the reply filed on November 1, 2010 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Claim Objections*

2. Claim 3 is objected to because of the following informalities: the cross-sectional area should be expressed in squared meters [$m^2$] rather than in meters. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Regarding claims 4, 5, 19 and 20, the phrase "particularly preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

5. Claim 11 recites the limitation "intermediate contact bars" in line 3. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic et al. (US Patent no. 5,679,240).

With regard to claims 1-3, Anastasijevic discloses an electrolytic process and apparatus for electro-winning and electrodepositing copper from an electrolyte solution containing the metal in ionogenic form (abstract; col. 1, lines 5-28), in which the electrolyte is passed through an electrolysis plant comprising at least one electrolytic cell (col. 3, lines 54-65) which in an electrolyte tank (1) for receiving the electrolyte (4) has at least two electrodes (K, A; figure 1) serving as an anode (A) and cathode (K), which are alternately arranged at a distance from each other (col. 2, lines 36-41), wherein during operation of the electrolysis the at least one cathode (K) is immersed into the electrolyte (4; figure 1) over a length of at least 1 meter (col. 1, lines 47-57). Even though Anastasijevic does not explicitly teach wherein at least one cathode is immersed into the electrolyte with a cross-sectional area of 2x1 meter, Anastasijevic teaches wherein the associated cathodes may have a corresponding large surface area so that the deposition rate will be improved (col. 1, lines 47-57). Therefore, one having

ordinary skill in the art would have found it obvious to immerse a desired/large surface area of the electrodes into the electrolyte, as taught by Anastasijevic, in order to improve the deposition rate and efficiency of the process thereby.

With regard to claim 4, even though Anastasijevic fails to explicitly teach wherein the at least one electrolytic cell has more than 60 cathodes, particularly preferably more than 100 cathodes, and quite particularly preferably 114 cathodes, Anastasijevic discloses wherein multiple anodes disposed alternately with a plurality of cathodes (figure 1; col. 2, lines 37-41). It is well known in the art to increase the amount of electrodes in an electrolytic cell for the extraction of metal under varying conditions. In addition, it has been held by the court that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CPA 1960).

With regard to claim 5, even though Anastasijevic fails to explicitly teach wherein the electrolysis is performed at a current density of more than 200A/$m^2$, particularly preferably between 250 and 370 A/$m^2$, Anastasijevic discloses that the process can be operated at high and very high current densities so that the anode can be used for an electrolysis resulting in high metal deposition (col. 1, lines 25-28). Therefore, one having ordinary skill in the art would have found it obvious to adjust the current density according to user's requirements in order to obtain a high metal deposition and increase the efficiency of the process thereby.

9. Claims 6, 7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic, as applied to claim 1, in view of Anastasijevic Nikola (DE 199 40698 – referred to as Nikola hereinafter).

With regard to claim 6, Anastasijevic discloses all of the limitations discussed in claim 1 above, wherein the electrodes have a horizontal hanger bar (6; figure 2) with a first end and a second end at the edge of the electrolyte tank (1) used to conduct current from an external DC source to the electrode (col. 3, lines 60-62) but fails to teach wherein two contact bars are provided, the first end of the hanger bar of the cathodes resting on one of the two contact bars via a two-line contact and the first end of the hanger bar of the anodes resting on the other one of the two contact bars via a two-line contact.

Nikola discloses an electrolysis plant comprising an electrolyte container (1) wherein the electrodes are have a horizontal hanger bar (8) provided with two bus bars (6, 7) arranged at the edge of the container (1; see figure 2), the bus bars (6, 7) have terminals to direct current source to several electrodes immersed in the electrolyte (page 1, paragraph 1; paragraph 8 – under description of figures). This configuration minimizes the transition resistance for the current flow (page 1, paragraph 5). therefore, one having ordinary skill in the art would have found it obvious to provide two bus bars in connection with the horizontal hanger bar, as taught by Nikola in the electrolysis plant of Anastasijevic, in order to minimize the current flow resistance.

With regard to claim 7, Nikola further teaches wherein the contact bars (6, 7) each have an at least substantially trapezoidal indentation (figures 2-4) on which rest

the respectively first ends of the hanger bars (8) with a contact surface having at least substantially rectangular cross-section (figures 2-4).

With regard to claims 9 and 10, Nikola discloses wherein an end of the hanger bar (8) of the electrodes rests on an equalizer bar (8b) which is arranged on one of the two contact bars (6; figures 3 and 4).

With regard to claims 11-12, Nikola discloses wherein the contact bars (6, 7) are cooled by cooling liquid passing through the bars (6, 7; page 1, paragraph 6).

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic in view of Nikola, as applied to claim 6, and further in view of Juric et al. (US Patent no. 2003/0173214).

With regard to claim 8, Anastasijevic discloses wherein for protection against corrosion, the copper carrying bar (6) is surrounded by a titanium sheath (col. 3, lines 60-65) instead of a steel sheath.

Juric teaches an aluminum reduction cell for the production of a metal which includes a plurality of collector bars (21; figure 1; abstract) wherein, for the purpose of controlling current distribution, each collector bar includes a core of relatively high electrical conductivity material, such as copper, and a housing of a more mechanically and chemically resistant material, i.e. steel, than the core material (abstract; paragraphs 12 and 33). This will also improve the spatial current density and therefore the stability of the electrolytic cell (paragraphs 14-15). Therefore, one having ordinary skill in the art would have found it obvious to replace the titanium sheath covering the copper core of the modified Anastasijevic, with a steel sheath, as taught by Juric, because steel is a

mechanically and chemically resistant material which along with the high electrical conductive copper core will control the current distribution, improve the spatial current density and therefore the stability of the electrolytic cell.

11. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic in view of Nikola, as applied to claim 11 above, and further in view of Gensini et al. (US Patent no. 5,651,024).

With regard to claims 13-15, the modified Anastasijevic discloses all of the limitations discussed above but fails to teach wherein the water is passed through the cooling water channel in a turbulent flow, wherein the contact bars to be cooled have two separate cooling circuits, one of which (primary circuit) is at least partly provided in the contact bars to be cooled, an which are both connected with each other by a heat exchanger and wherein the primary circuit is fed with purified water and the second cooling circuit is fed with crude water.

Gensini discloses a cooling mechanism comprising a contact rod made of copper connected to a steel electrode so as to form a copper-steel structure (col. 2, line 56 to col. 3, line 2), the copper cooling means consist of a plurality of annular columns or spiral elements starting from a strongly cooled common base, the common base includes a heat exchanger means of high efficiency (col. 3, lines 27-31); the cooling system includes a central pipe for the discharge of water and an outer annular pipe to feed water (col. 5, lines 16-20) in which the cooling water follows an obligatory path so as to increase the heat exchange surfaces between the cooling system and the copper cooling means (col. 5, lines 21-26; figures 1-3). This configuration improves and

increases the efficiency of the cooling action of the device as well as its work life and prevents possible operational accidents (col. 1, lines 14-21). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a cooling system as taught by Gensini, because it would improve and increase the efficiency of the cooling action of the device as well as its work life and would prevent possible operational accidents. Even though the modified Anastasijevic fails to explicitly teach wherein the cooling water is passed in a turbulent flow, one having ordinary skill in the art would have found it obvious to modify the velocity of the water passing through the cooling channels in order to obtain different flow regimens, either turbulent or laminar, and increase the efficiency of the heat exchanging process according to user's requirements.

With regard to claims 16 and 17, Anastasijevic discloses wherein the electrolytic cell is provided with a flow distributor through which operation of the cell, electrolyte solution is introduced into the cell (col. 2, lines 55-59; col. 3, lines 53-60), wherein the fluid distributor/inlet (2) is disposed at the lower end of the cell (1) and the fluid is introduced into the cell through the distributor (2) below the lower end of the electrodes (K, A; see figure 1).

12. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic in view of Nikola and Genisini, as applied to claim 18 above, and further in view of Andersen et al. (US Patent no. 4,098,668).

With regard to claims 18-20, the modified Anastasijevic fails to explicitly teach wherein the fluid distributor consists of two tubes arranged substantially parallel to the

longitudinal sides of the electrolytic cell, which at their surface each have one or more fluid outlet holes and whose first ends are each connected with a fluid supply conduit, wherein the fluid distributor has about 1 to 5, particularly preferably about 1 to 2 fluid outlet holes per electrode pair and cell side provided in the cell, whose arrangement is substantially adjusted to the spaces between the electrodes.

Andersen teaches an electrolytic apparatus and process for extraction of metals comprising wherein the fluid distributor consists of two tubes/pipes (24, 25) arranged substantially parallel to the longitudinal sides of the electrolytic cell (figures 1, 6 and 8), which at their surface each have one or more fluid outlet holes (27 and 26, respectively) and whose first ends are each connected with a fluid supply conduit (19; figure 1; col. 3, lines 42-45), wherein the fluid distributor has at least one outlet hole having a diameter in the range of 1.59 to 12.7 mm (col. 4, lines 53-57) per electrode pair and cell side provided in the cell (figures 5 and 7), whose arrangement is substantially adjusted to the spaces between the electrodes to avoid turbulence (col. 3, lines 45-49). This configuration provides a process and apparatus by which pure metal may be extracted in a simple, efficient and yet extremely economic manner (col. 2, lines 8-12). Therefore, one having ordinary skill in the art would have found it obvious to modify the fluid distributor in the electrolytic cell of the modified Anastasijevic, as taught by Andersen, in order to provide a process and apparatus by which pure metal may be extracted in a simple, efficient and yet extremely economic manner.

With regard to claim 21, Andersen further teaches wherein the electrolytic cell has two electrolyte outlets (23, 15; figure 1).

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anastasijevic in view of Nikola and Genisini, as applied to claim 16 above, and further in view of Hiai et al. (US Patent no. 5,865,967).

With regard to claim 22, even though the modified Anastasijevic fails to explicitly teach wherein the cathodes have an indentation of V-shaped cross-section at their lower longitudinal edge, it is well known in the art to modify the shape of the electrodes for the extraction of metal under varying conditions, as taught by Andersen (col. 2, line 66 to col. 3, line 1) and evidenced by Hiai.

Hiai discloses a method and apparatus for electrowinning metals (abstract) wherein the electrode may have an indentation of V-shaped cross-section at their lower longitudinal edge in order to enable easy peeling of the precipitated metal from the cathode plate and improves the shielding performance of the insulator against the electrolytic precipitation (col. 1, lines 37-58). Therefore, one having ordinary skill in the art would have found it obvious to modify the shape of the cathode, as taught by Hiai, in the electrolytic cell of the modified Anastasijevic, in order to enable easy peeling of the precipitated metal from the cathode plate and improves the shielding performance of the insulator against the electrolytic precipitation. In addition, it has been held that the configuration or shape of a claimed device is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed device is significant. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Tuesday-Friday from 9am to 7pm.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1723

/Z. M./
Examiner, Art Unit 1723